Air Quality & Storm Water

Integrating Greenhouse Gas Reduction and Water Quality Improvement into Your EMS Objectives

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Air Regs and GHG

- Greenhouse Gases ARE air pollutants and ARE regulated under the Clean Air Act (EPA, 2007)

- GHG Mandatory Reporting Rule

- GHG Tailoring Rule

- New Source Performance Standards for Landfills

- Title V (Part 70) Operating Permits

Title V & GHG Reporting

Refine Metrics & Nail Down Your Benchmark

- Gain an accurate picture of your site's environmental impact
- NMOC and methane concentrations from Tier II
- New cell construction? Contractors can collect data, so you don't have to.
- Understanding nuisances of the rules can make a big difference.

Description	LFG Collection Efficiency
No active gas collection	0%
Daily cover and active gas collection	60%
Intermediate cover and active gas collection	75%
Final cover (3 ft clay and/or geomembrane) and active gas collection	95%

40 CFR Subpart HH, Table HH-3 (SWICS, 2009)

Air Compliance Objectives

- Know where you stand - set a benchmark and evaluate your progress
- Guidance for when approvals, notifications, and deviation reports are due
- Managing shutdowns related to system maintenance
- Surface emissions monitoring - evaluate cover integrity
- GCCS Performance Evaluation (large sites)
- Diagnose and remediate methane migration (all sites)

Storm Water Quality

- IDNR NPDES General Permit No. 1 became effective October 1, 2012

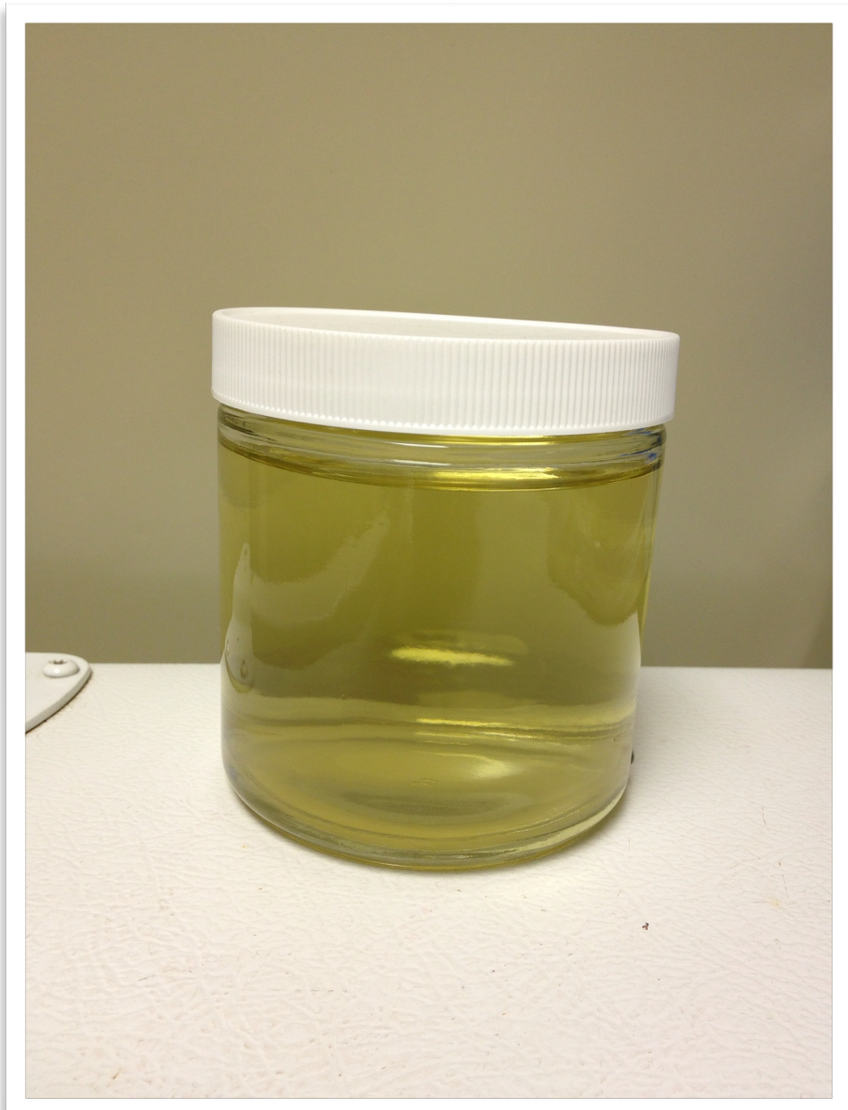
- For landfills, we focus on two main issues above all else:

  - Sedimentation and erosion control

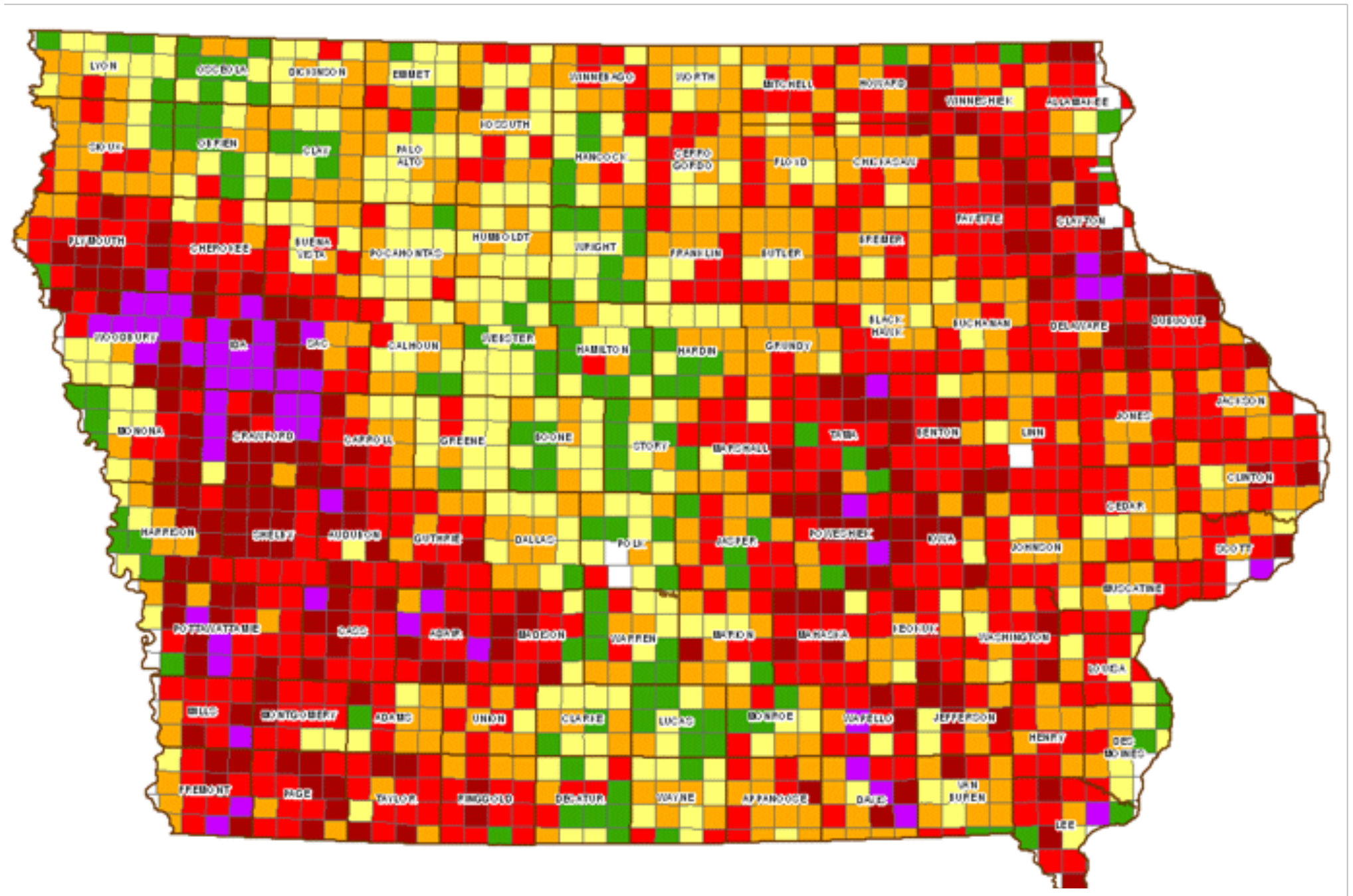
  - Eliminating non-storm water discharges (...leachate)

Visual Monitoring

- Color
- Odor
- Clarity
- Solids (floating, settled, suspended)
- Oil Sheen
- Foam
- Other obvious indicators of storm water pollution



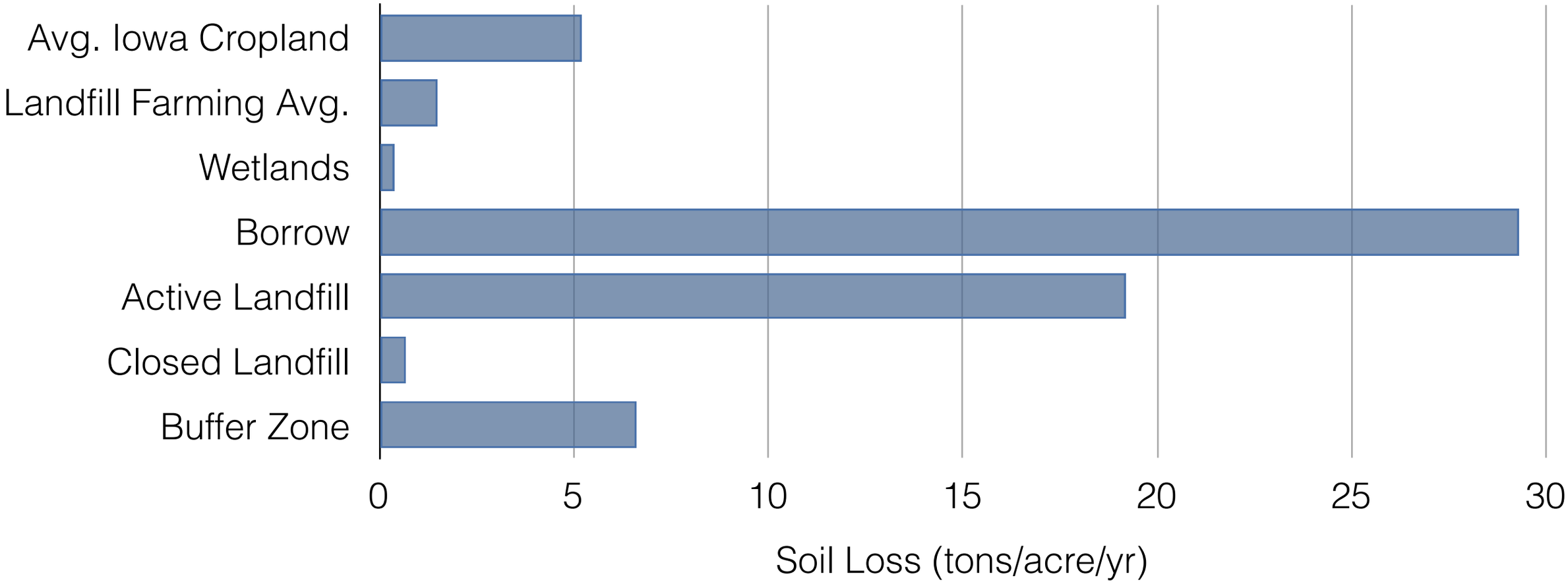
Sedimentation and Erosion Control



Average Soil Erosion (tons/acre)

No Data | 0 - 5.0 | 5.1 - 10.0 | 10.1 - 20.0 | 20.1 - 50.0 | 50.1 - 100.0 | Greater than 100

Quantify Your Benchmark



Leachate Management

The bridge between air quality and storm water

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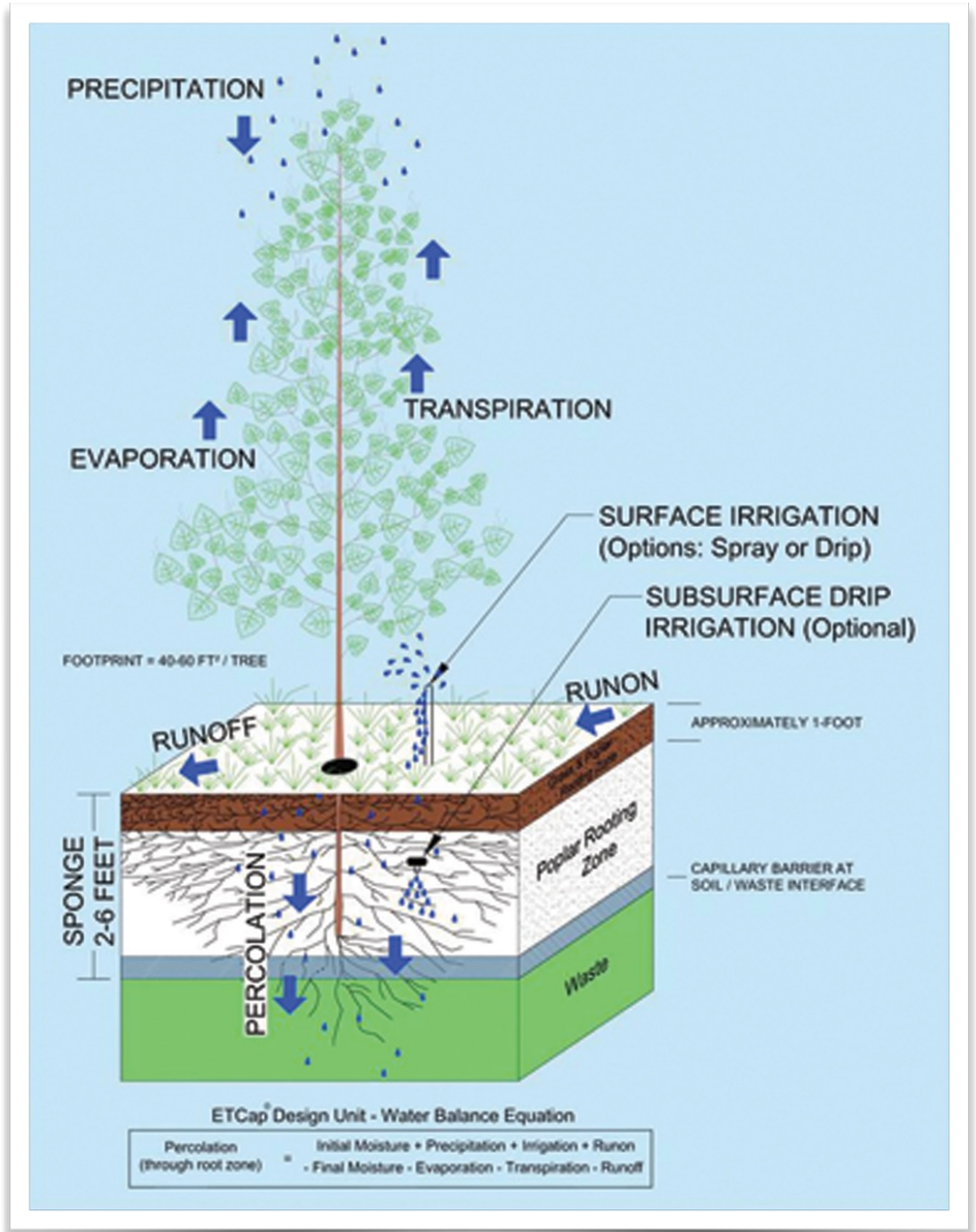
LFG-Fired Leachate Evaporator

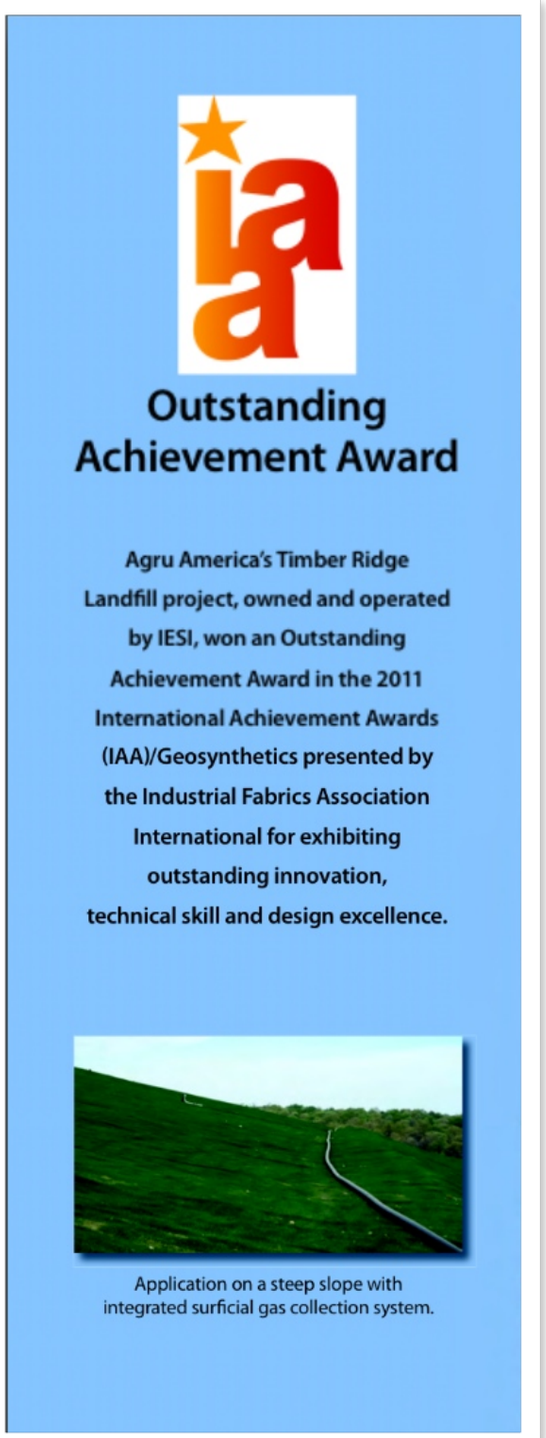
- Municipality near Denver, CO
- Trucking ~1.5 MGPY to POTW
- Recirculating ~150K to 500K GPY
- Phase 1 in construction now
  - 100 gal/hr leachate
  - 100 scfm LFG
  - 4,000 LF HDPE pipe
  - 7.5 hp booster blower

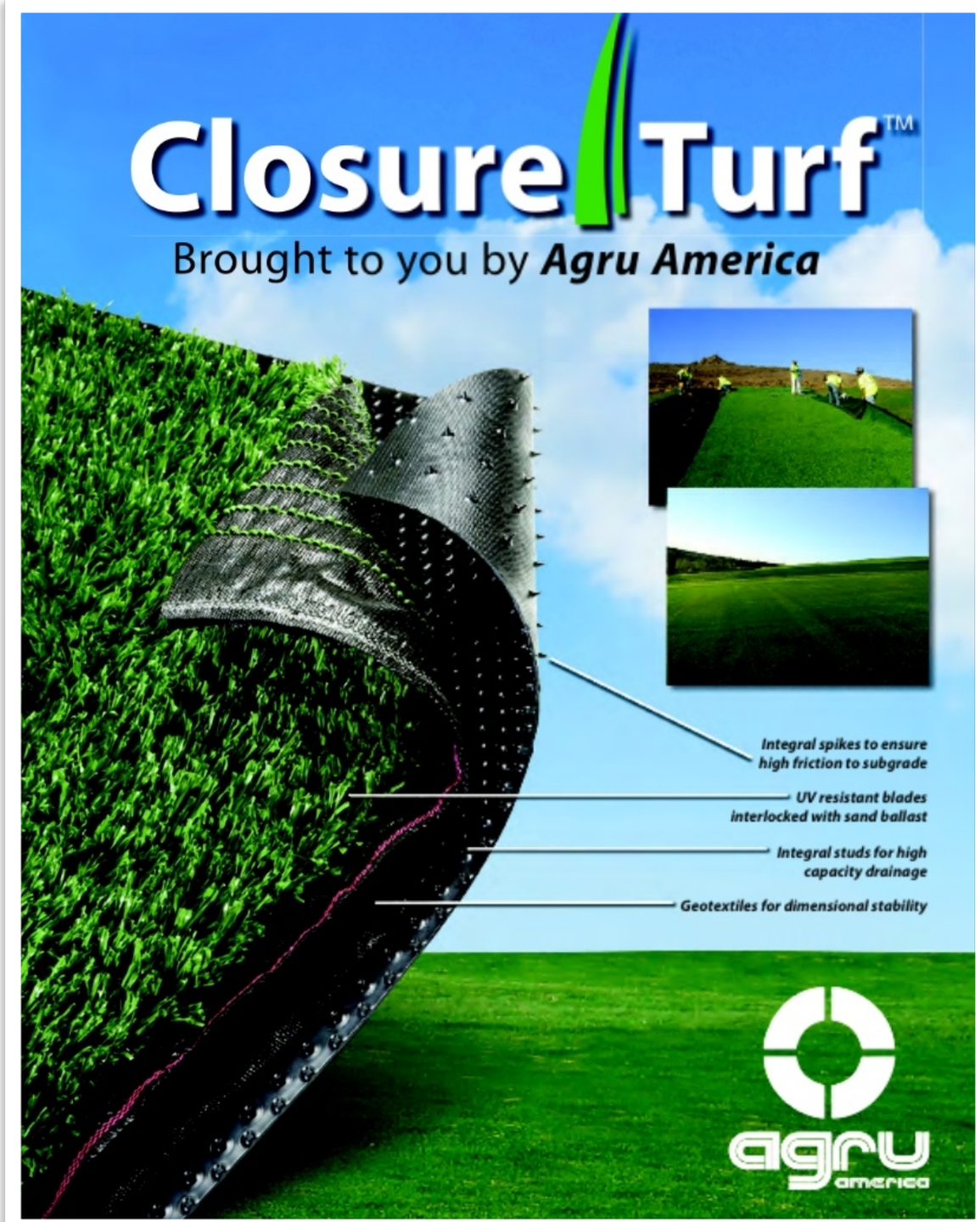
Phytoremediation

- Vetiver grass and/or hybrid poplar trees
- Storm water quality improvement
    - Eliminate infiltration and dry up leachate seeps
    - Control sediment runoff and beneficially use leachate compounds
- Air quality improvement, case study at GCAL
    - 9 acres, 3.5 MG leachate per year
    - 280 ton CO2 reduction per year
- Leachate management costs ~ 1 to 2 cents/gal
    - 2-5 year payback period



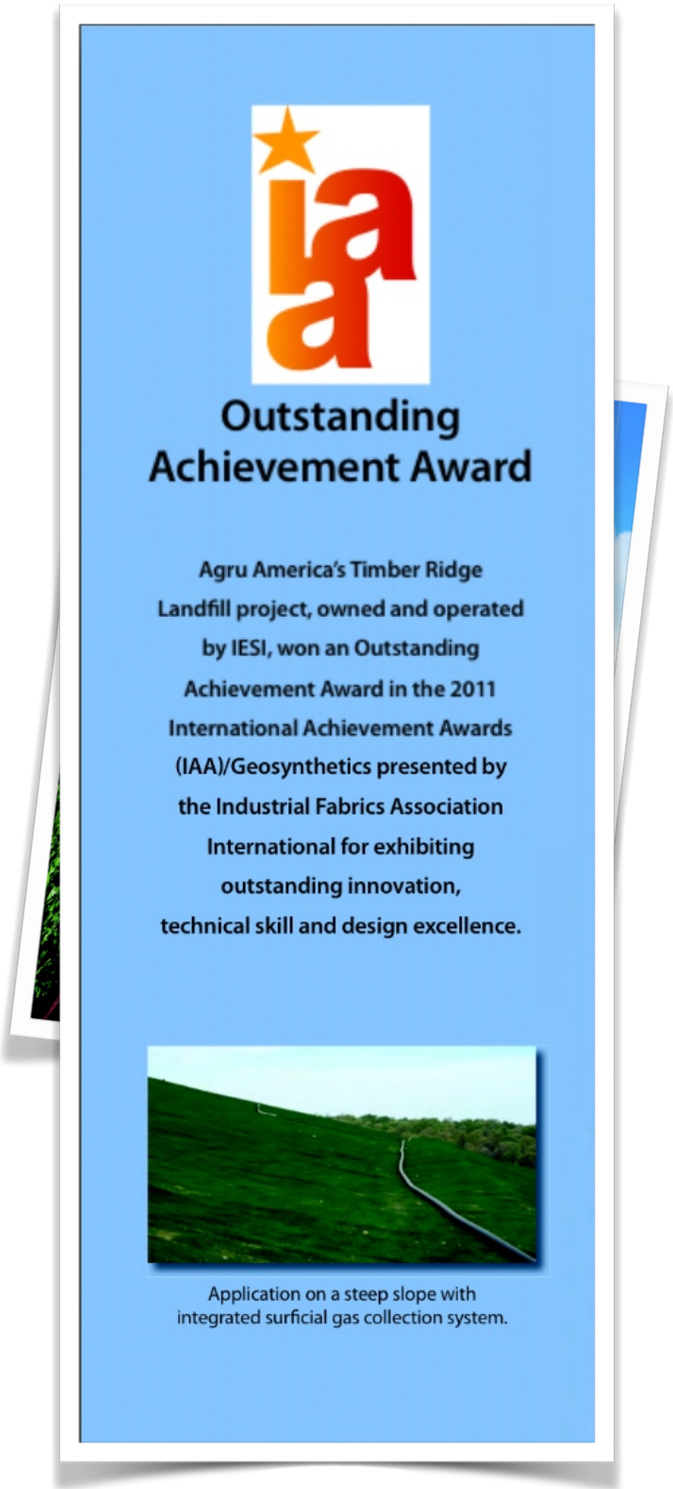
Closure Turf Project





Closure Turf Project

- IESI Timber Ridge Landfill Richwoods, MO
- 10 acre sideslope closure
- Proactive approach to capture methane at early stages of generation and reduce storm water infiltration
- Carbon footprint reduced from 291 tons/ac to 58 ton/ac from construction alone
- Immediate recovery of 500 scfm LFG
- Surficial LFG collection, so no vertical wells and significant reduction in condensate



Construction Closure Cost Savings	$9,200	Per Acre	Initial Capital Savings
GCCS Savings of Surficial vs. Conventional	$8,500	Per Acre	Minimize or Eliminate Vertical Wells
Post Closure Maintenance Savings	$51,071	Per Acre	Over 30-year Period
Additional Airspace Revenue	$30,492	Per Acre	18" Airspace Gained w/ Tipping Fee of $18/ton
Total Savings	**$99,263**	**Per Acre**	

Monetize Carbon Credits = ~$175,000 per year

Closure Turf Construction

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